

## ***Internet filtering, information poverty, and digital literacy: Intersections and challenges***

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### ***Introduction***

Information poverty has been a topic of research for decades, yet this phrase has struggled to gain traction in popular discourse until recently. It has been defined as “groups and individuals who do not have adequate and equal access to quality and quantity information” (Shen, 2013, para. 1). Britz (2004) emphasized that information poverty is caused in part by unequal or poorly developed information infrastructure, which often disproportionately affects already-marginalized communities and individuals.

There are numerous factors which contribute to information poverty, which are often portrayed simplistically, such as whether one has broadband internet in the home. Our agenda takes a more nuanced position, holding that information access is often circumscribed by those in (relative) power, even when the means to access information is provided. That is, information poverty is exacerbated by censorship. When one must use public institutions to gain access to information, access is determined by those who manage the institution. In the U.S., for example, millions of individuals rely upon their public libraries for access to information through libraries’ collections of books, magazines, journals, audiovisual resources, newspapers, and technology, including reliable computing equipment and internet access. Any restrictions to this information result in an impoverished information world for those who are reliant upon it. Reddick (2004) notes that access inequalities “reflect the longstanding inequality of access to power and resources, as well as to social participation” (p. 13). According to Pew Research Center (2016), 23% of Americans used computers or Wi-fi in libraries in the past year.

One concrete way in which relative power in public institutions is wielded is in the implementation of internet filtering, which, we argue, is interwoven with the complexities of information poverty (and digital literacy), as described below.

### ***Internet filtering***

The Children’s Internet Protection Act (CIPA) was passed in the U.S. in 2000 and upheld by the Supreme Court in 2003 (*United States v. American Library Association*, 2003). According to this law, all public schools and public libraries that receive certain federal funds must install a “technology protection measure” to prevent minors from accessing images that are child pornography, obscenity, or harmful to minors. Child pornography and obscenity have a long (though sometimes contested) history of falling outside First Amendment protection, the category of “harmful to minors” refers to a visual depiction that:

(A) taken as a whole and with respect to minors, appeals to a prurient interest in nudity, sex, or excretion; (B) depicts, describes, or represents, in a patently offensive way with respect to what is suitable for minors, an actual or simulated sexual act or sexual contact, actual or simulated normal or perverted sexual acts, or a lewd exhibition of the genitals; and (C) taken as a whole, lacks serious literary, artistic, political, or scientific value as to minors (2000).

CIPA defines a technology protection measure as an internet filter; to comply with the law, *all* computing devices (not just those used by minors) in an affected institution must be

protected by an internet filter.<sup>1</sup> This requirement is tied to federal e-rate funding, which helps public schools and public libraries afford internet access and other telecommunication products and services. In addition to CIPA, 26 states have enacted further laws requiring internet filtering in public schools and/or public libraries (National Conference of State Legislatures, 2016). Most internet filtering software is produced by for-profit companies, such as CYBERsitter and Net Nanny. As a result, the exact methods used to filter are considered proprietary and not public knowledge. There are a variety of ways that internet filtering can be implemented, but perhaps the most common approach is to install filtering software at the system level (i.e., across all machines at a public library). Filters can work by preventing users from accessing sites that have been black-listed while allowing access to other sites. Users will receive an error message when trying to access blocked sites.

Generally, filters group blocked sites into categories such as adult themes, alcohol, gambling, and so on. See Figure 1 for an example of web categories that can be blocked according to K9 Web Protection, a filtering company (image taken from Peterson, Oltmann, and Knox, 2017). Note that in this image, all of the commonly blocked categories are checked, along with some “other categories,” meaning that this library has blocked a large amount of information with its internet filter.

This list of categories, clearly, does not neatly align with the categories prohibited by CIPA (again, child pornography, obscenity, and harmful to minors). In fact, all of the categories listed in the image above are protected by the First Amendment as legal speech (except possibly some of the content in the category called “illegal/ questionable”). Furthermore, because these categories do not map neatly onto the law, filtering becomes “inherently subject to the normative and technological choices made during the software design process” (Deibert, Palfrey, Rohozinski, & Zittrain, 2010, p. 372; see also Brown & McMenemy, 2013). In other words, the results of filtering are dependent on the subjective choices made by individuals when the filters are designed and implemented.

Internet filters are well-known to have two shortcomings: they both underblock and overblock content (e.g., Cooke, Spacey, Creaser, & Muir, 2014; Cooke, Spacey, Muir, & Creaser, 2014; Deibert, Palfrey, Rohozinski, & Zittrain, 2008). Some content that should not be allowed gets through, while content that should be allowed is blocked; it has been suggested that filters over- or under-block 15-20 percent of the time (Batch, 2014). Research testing the efficacy of internet filters is somewhat limited and dated. Chou, Sinha, & Zhao (2010), for example, tested the efficacy of three top-ranked internet filters and found that all were outperformed by using text mining approaches. Some researchers have examined whether internet filtering is effective in protecting minors, but the limited data “fails to provide support for governmental and industry advice regarding the assumed benefits of filtering for protecting minors online” (Przybylski & Nash, 2017, p. 217).

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<sup>1</sup> Note: Guidance issued by the FCC in 2019 clarifies this, stating that technology protection measures must block obscenity and child pornography from all computers; in addition, content that is harmful to minors must be blocked from computers accessible by minors (see: <https://www.fcc.gov/consumers/guides/childrens-internet-protection-act>).

# K9 Web Protection Administration

[HOME](#) | [VIEW INTERNET ACTIVITY](#) | [SETUP](#) | [GET HELP](#)

## Web Categories to Block

Set the categories you want to block or allow. [More Help . . .](#)

- High Protects against all default-level categories plus social interaction and unrated sites.
- Default Protects against all adult content, security threats and sexually-suggestive sites.
- Moderate Protects against adult content, security threats and illegal activity.
- Minimal Protects against pornography and security threats.
- Monitor Allows all categories - only logs traffic.
- Custom Select your own set of categories to block.

Place a check next to the categories you wish to block. (Click category name for description.)

Commonly Blocked Categories			<a href="#">Unblock All</a> <a href="#">Block All</a>
<input checked="" type="checkbox"/> Abortion	<input checked="" type="checkbox"/> Illegal / Questionable	<input checked="" type="checkbox"/> Pornography	
<input checked="" type="checkbox"/> Adult / Mature Content	<input checked="" type="checkbox"/> Illegal Drugs	<input checked="" type="checkbox"/> Proxy Avoidance	
<input checked="" type="checkbox"/> Alcohol	<input checked="" type="checkbox"/> Intimate Apparel / Swimsuit	<input checked="" type="checkbox"/> Sex Education	
<input checked="" type="checkbox"/> Alternative Sexuality / Lifestyles	<input checked="" type="checkbox"/> Nudity	<input checked="" type="checkbox"/> Spyware / Malware Sources	
<input checked="" type="checkbox"/> Alternative Spirituality / Occult	<input checked="" type="checkbox"/> Open Image / Media Search	<input checked="" type="checkbox"/> Spyware Effects	
<input checked="" type="checkbox"/> Extreme	<input checked="" type="checkbox"/> Peer-to-Peer (P2P)	<input checked="" type="checkbox"/> Suspicious	
<input checked="" type="checkbox"/> Gambling	<input checked="" type="checkbox"/> Personals / Dating	<input checked="" type="checkbox"/> Tobacco	
<input checked="" type="checkbox"/> Hacking	<input checked="" type="checkbox"/> Phishing	<input checked="" type="checkbox"/> Violence / Hate / Racism	
Other Categories			<a href="#">Unblock All</a> <a href="#">Block All</a>
<input type="checkbox"/> Arts / Entertainment	<input type="checkbox"/> Humor / Jokes	<input type="checkbox"/> Remote Access Tools	
<input type="checkbox"/> Auctions	<input type="checkbox"/> Job Search / Careers	<input type="checkbox"/> Restaurants / Dining / Food	
<input type="checkbox"/> Brokerage / Trading	<input type="checkbox"/> LGBT	<input type="checkbox"/> Search Engines / Portals	
<input type="checkbox"/> Business / Economy	<input type="checkbox"/> Military	<input type="checkbox"/> Shopping	
<input checked="" type="checkbox"/> Chat / Instant Messaging	<input type="checkbox"/> News / Media	<input checked="" type="checkbox"/> Social Networking	
<input type="checkbox"/> Computers / Internet	<input type="checkbox"/> Newsgroups / Forums	<input type="checkbox"/> Society / Daily Living	
<input type="checkbox"/> Content Servers	<input type="checkbox"/> Non-viewable	<input type="checkbox"/> Software Downloads	
<input type="checkbox"/> Cultural / Charitable Organizations	<input type="checkbox"/> Online Storage	<input type="checkbox"/> Sports / Recreation	
<input type="checkbox"/> Education	<input type="checkbox"/> Pay to Surf	<input checked="" type="checkbox"/> Streaming Media / MP3	
<input type="checkbox"/> Email	<input type="checkbox"/> Personal Pages / Blogs	<input type="checkbox"/> Travel	
<input type="checkbox"/> Financial Services	<input type="checkbox"/> Placeholders	<input type="checkbox"/> Vehicles	

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**Figure 2. K9 Configuration at Alice Municipal Library.**

Figure 1. Configurations of an internet filter at one Alabama public library. Taken from Peterson, Oltmann, & Knox (2017).

CIPA requires internet filtering in public school and public libraries that receive e-rate federal funding (2000). Despite this federal law, the exact rates of filtering implementation in the U.S. are unknown. In 2009, Jaeger and Yan estimated that at least 51.3% of public libraries used internet filters and that 100% of schools used internet filters. In contrast, Kolderup (2013) reported that 65% of public libraries were filtering by 2005. However, by 2014, the Institute for Museum and Library Services (IMLS) estimated that 73% of public libraries received e-rate discounts in 2014 and over 90% of libraries had used e-rate at least once in the past eleven years (IMLS, 2014); according to CIPA, all of those libraries would have to certify they were using filters. It is troubling that CIPA mandates internet filtering for those institutions that receive e-rate funding yet there seems to be no hard data on compliance in libraries or schools. These institutions are required to self-certify that they have implemented internet filters that meet the requirements of CIPA, but to date there is no research or data that examines the level of implementation.

We also do not know *how* filters are being implemented: which categories are blocked? Is there variation regionally? Other factors such as size of the institution, training of the individuals in charge, socioeconomic level, race/ethnicity, religion, and so on may play a role as well; currently these questions are unanswered (and, in fact, mostly *unasked* in U.S. research). Furthermore, we know that variation in these factors, particularly socioeconomic status, is linked to information poverty (see next section), which can compound the impact of internet filtering. More research needs to be conducted to understand the depth and breadth of internet filtering in the U.S.

The relative lack of data in the U.S. contrasts with other nations, particularly the U.K. and Scotland. Though there is no equivalent to CIPA there, researchers have investigated the rate of internet filtering in public libraries. In 2013, Brown and McMenemy reported that all of their respondents had implemented filtering. Blocked content included actually illegal content/activity, potentially illegal content/activity, and value judgement-grounded categories (such as the category “tasteless”) (p. 192). Across the U.K., Cooke, Spacey, Creaser, and Muir (2014) studied the implementation of internet filtering and, again, 100% of their respondents reported using filtering. They noted that “currently, there appears to be little standardisation [sic], guidance or transparency about measures being taken to prevent misuse” (2014, p. 6).

### ***Information poverty and internet filtering***

The concept of information poverty, while long a concern of LIS scholars, was first articulated into a research framework by Elfreda Chatman (1996) and was intended to be descriptive (not necessarily pejorative). Chatman suggested that “an impoverished information world” was associated with the following characteristics: being devoid of sources, associated with social class, use of self-protective behaviors such as secrecy and deception, and negative consequences outweighing benefits. She argued, “An impoverished information world is one in which a person is unwilling or unable to solve a critical worry or concern. Because needs are not being met, this information world is viewed by an insider as dysfunctional” (p. 197). In Chatman’s research, sometimes the information poverty was exacerbated by individuals’ own choices, such as decisions to engage in secrecy (not sharing their information need) or deception (hiding their information need), undertaken to reduce their personal risks. Much subsequent research and commentary on information poverty has followed Chatman’s work. For example, Britz (2004) defined information poverty as:

That situation in which individuals and communities, within a given context, do not have the requisite skills, abilities or material means to obtain efficient access to information,

interpret it and apply it appropriately. It is further characterized by a lack of essential information and a poorly developed information infrastructure (p. 194).

In this definition, we see an emphasis on individuals' skills, abilities, and material means, which leave them unable to use whatever information they are able to access. However, it's worth noting that Britz does include "a given context here," though he does not delve into its parameters or implications. Subsequently, he also adds that "the right of access to essential information...must be regarded as one of the most important rights in the information era" but this right is "threatened by amongst others the commoditization of essential information and the exclusive (and exclusionary) use of modern information technology" (p. 197).

Strand and Britz (2018) defined information poverty as "that situation in which people, within a specific context, do not have the required skills, abilities, and/or material means to access and use information in a meaningful way to address their needs" (p. 364; see also Britz, 2001). Here, the authors mention the "specific context," but do not explicitly address the ways that contextual components can systemically disadvantage or marginalize those who are informationally impoverished (Gibson & Martin, 2019). Marcella and Chowdhury's (2018) research agenda addresses information poverty as "denied access to the information necessary for survival, self-sufficiency, sustainability or development" (p. 2). This definition seems to shift the agency of the denial at least partially away from the individual, as the authors then address numerous causal factors that contribute to information poverty: human and behavioral factors; social and cultural factors; trust factors relating to politics and propaganda; information creation, distribution and management practices; ICT, infrastructure and systems; national and international information regulations and policies; economic factors as in having the resources and capacity; and perpetual environmental disasters and calamities (p. 12). Yet, many of these causal factors still seem rooted in individual characteristics.

Throughout many of these scholars' work, post-Chatman, the causation of information poverty remains cloudy. For example, Lingel and boyd (2013) argued, "when researching information practices of marginalized communities, considering social context reveals how different kinds of privilege shape access to and use of information" (p. 982). But it's unclear how they conceive of marginalization, social context, or privilege within their study (or more broadly), or how these concepts might be affecting information poverty. While their conclusion notes that "in most studies of information poverty, the groups being studied are systematically marginalized in ways that shape access to information" (p. 989), the authors do not delve into the systematic (or systemic) marginalization in depth. As Gibson and Martin (2019) explained, "much of the theory around information poverty focuses on the behavior of the individual (experiencing 'poverty') rather than the institution (creating 'poverty')" (p. 476).

Gibson and Martin (2019) introduced the concept of *information marginalization* to "describe the institutional and or community-level mechanisms by which information poverty is created" and recommended using a critical approach, which will uncover "the development of systemic, contextual barriers to information access" (p. 477). While acknowledging that individuals may have characteristics and habits that contribute to information deficits, the authors argued that "in blaming individuals and communities for their own information poverty, this approach stymies our ability to understand the underlying structural inequalities that deny them agency" (p. 478). Indeed, these authors suggested viewing "information poverty-related behaviors" as "red flags" that information systems are exposing systemic inequalities and structural marginalization (p. 485).

With this turn to systemic marginalization and inequality, the relevance of information poverty to internet filtering is heightened. Many scholars have noted that there is a correlation between information poverty and economic poverty. At the same time, internet filters are more likely to be installed in areas of low socioeconomic status, due to their connection through CIPA with e-rate funding (since e-rate funding is tied to the level of poverty in the community as

measured by the number of free lunches distributed by community schools). Public schools and public libraries which struggle financially are more likely to need e-rate assistance and thus more likely to install internet filters to be in compliance with CIPA. If these internet filters are then overblocking and underblocking content, and/or too many content categories are blocked by an overzealous administrator, individuals will be experiencing reduced access to information. These are, still, open questions, as research has not yet been conducted to demonstrate whether or to what extent these situations occur.

### ***Digital literacy and internet filtering***

Definitions of digital literacy vary across the existing research; Feerrar (2019) noted that “dissatisfaction with existing definitions and uses of the term is common throughout the literature” (p. 93). For example, in 2013, the American Library Association’s Office for Information Technology defined digital literacy as the ability to “find, understand, evaluate, create, and communicate digital information” (para. 4). The American Association of School Librarians (AASL) suggested digital literacy is “the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills” (2016, para. 5). Some scholars defined digital literacy as the ability to use digital tools and reflect critically (e.g., Hall, Atkins, & Fraser, 2014). Feerrar’s team developed a framework to describe digital literacy around the themes of discovery, evaluation, ethics, creation and scholarship, communication and collaboration, curation, and identity and wellbeing (p. 98).

The New Media Consortium’s Horizon Project emphasized that “critically finding, assessing, and using digital content within the vast and sometimes chaotic internet appears as a vital skill in almost every account” of digital literacy (Alexander, Adams Becker, Cummins, & Hall Giesinger, 2017, p. 4; see also Feerrar, 2019, p. 94). Hall, Atkins, and Fraser (2014) developed a framework that reflected “an essential set of contextualised [sic] practices, and which includes a critical attitude towards the use of technology” (p. 7), and which explicitly includes “the ability to evaluate information sources and judge their suitability and reliability” (p. 8). Finally, these researchers note that the foundation of digital literacy must be “responsible and ethical behavior” online, with an awareness of one’s digital footprint and the consequences of one’s digital actions (p. 8).

Hall, Atkins, and Fraser’s (2014) emphasis on a critical attitude toward technology echoes the *information discernment* concept developed by Walton and Hepworth (2013), defined as “the ability to use higher order thinking skills to make sound and complex judgments regarding a range of text-based materials” (p. 55), though today we would likely extend the need for discernment to audio and visual materials as well.

In this white paper, we suggest that internet filtering may leave users (especially minors and those who are less technologically sophisticated) unable to fully master these conceptualizations of digital literacy (Adler, 2011; ACLU-RI, 2013; Batch, 2014; Cooke et al, 2014; Przybylski & Nash, 2017). As Cooke and colleagues explained, “by limiting their access to the full range of content, users are not learning the information literacy skills that afford genuine and sustainable protection in the digital arena” (Cooke, Spacey, Muir, & Creaser, 2014, p. 189). In particular, users of a filtered internet do not gain the ability to develop and hone their critical discernment skills, an essential component of digital literacy. As Tomczyk (2019) notes, “an important aspect of DL [digital literacy] is the safe use of electronic media” (p. 170). If students never have the ability to learn to navigate between safe and less-safe sites, or how to differentiate between them, due to internet filters, how will they learn these skills?

Users of a filtered internet may not learn how to evaluate risky sites; because such sites do exist, this “places increasing importance on developing the skills and understanding

required to navigate digital worlds safely” (Walton, Pickard, & Dodd, 2018, p. 299). The American Association of School Librarians (AASL) has several standards that address digital literacy in this context, such as “learners act on an information need by making critical choices about information sources to use” and “learners exchange information resources within and beyond their learning community by accessing and evaluating collaboratively constructed information sites” (AASL Standards Framework for Learners). However, minors who only access a filtered internet in school settings will not learn the full range of skills necessary to be successful in these ways. In fact, some research shows that most young people “are not careful, discerning users of the internet” (Bartlett & Miller, 2011, p. 3; see also Pickard, Shenton, & Johnson, 2014).

In contrast to approaches (such as internet filtering) that restrict access to some digital information, Walton, Pickard, and Dodd (2018) noted that “digital literacy offers a different approach—rather than attempting to control or restrict young people’s use of the internet, we instead instil [sic] in them the capabilities to protect themselves” (p. 298). Similarly, other researchers argue:

The answer [to risky sites] is not greater censorship or a tighter control over internet content. The task is to ensure that young people can make careful, skeptical and savvy judgments about the internet content they will, inevitably, encounter...we use the term ‘digital fluency’ to describe this competence: the ability to *find and critically evaluate* online information (Bartlett & Miller, 2011, p. 4, emphasis added).

On the other hand, perhaps internet filtering has benefits in terms of digital literacy, by preventing access to images that are “harmful to minors” (as required by CIPA). We do not have concrete measurements of the potential or actual advantages of deploying internet filters from a child development or digital literacy perspective; this sort of research would round out and add depth to the conversation about internet filtering.

### ***Bringing these areas together***

As discussed above, internet filtering has three interrelated research issues: disparate effects of filtering, along socioeconomic lines, a lack of research and knowledge about internet filtering in the U.S.; and possible negative impacts on digital literacy. Each problem is unique and important, but together they pose a significant impact on the accessibility of information to the public.

In the national internet filtering symposium, to be held in Lexington, Kentucky, in February 2021, we will investigate these interlocking problems of internet filtering, digital literacy, and information poverty. People need access to a wide range of information to learn and grow, but internet filtering threatens this ideal. Furthermore, internet filtering can negatively reduce digital literacy for those who are using a restricted internet. This is a crucial area for libraries and their allies because of the resulting unequal access to information and opportunities in already-marginalized communities.

However, the national conversation and research on these topics is scarce. We do not have research that addresses the interaction between internet filtering and digital literacy or the ways in which filtering can compound information poverty; we also lack reports from practitioners about the impacts of internet filtering in their day-to-day interactions with patrons and marginalized communities. The proposed symposium seeks to rectify these gaps in our knowledge. Thus, this white paper ends with a call for more research and analysis of internet filtering and how it intersects with information poverty and digital literacy.

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